ON HAEMOLYSIS IN MALARIAL FEVER

BY

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PRELIMINARY NOTE

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In a previous paper* it was shown, (by estimation of the excretion of blood pigments,) that in all probability there is a greater or less degree of haemolysis in all cases of malaria, and that the great haemolysis of blackwater fever was probably only a more marked phase of such general haemolysis.

In the last eighteen months fifty cases of malaria in the Royal Southern Hospital, Liverpool, have been examined at various stages of the paroxysm, and in the intervals, to discover if at any period a haemolytic principle could be discovered in the serum.

The blood was drawn into citrate solution and centrifuged in the pipettes, and the serum was separated from the corpuscles: the corpuscles were washed with normal saline, re-centrifuged, and made into a 5% emulsion. Non-malarial blood was similarly treated.

Mixtures were made each in one or two dilutions, incubated at 37° C., and examined after half an hour, one hour, and longer intervals.

The following mixtures were used:—

Malarial corpuscles and malarial serum.
,, ,, ,, normal serum.
,, ,, ,, ,, ,, and malarial serum.
Normal ,, ,, ,, ,, ,, ,, ,,
,, ,, ,, malarial serum.
,, ,, ,, ,, ,,

In no case did the control serum haemolyse the control corpuscles. In only one case did malarial corpuscles appear to be dissolved by control serum, and then only to a very slight extent.

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In no case did addition of control serum to malarial serum appear to modify the effect of malarial serum alone. (Heated malarial sera were not tried.)

Only seven times out of one hundred observations did the malarial serum exert any haemolytic action, and in two of these it was extremely slight: in the other five cases definite haemolysis took place.

I. C., age 32. Simple tertian fever: No quinine, first attack. Onset eleven days before admission. Shivering at 11.30 a.m. Paroxysm came on later: 9,200 parasites per c.mm., young and sporulating, found in blood at 11 a.m. 11.30 a.m., serum markedly haemolytic to control corpuscles. More rapid haemolysis to patient's corpuscles. Patient's corpuscles appeared slightly dissolved in control serum. 2.30 p.m., fever present. No haemolysis. Next day, no fever, no haemolysis.

II. T., age 18. Simple tertian: No quinine. 11.30 a.m., preliminary rigor. Serum markedly haemolytic to control corpuscles and to patient's corpuscles. 3 p.m., T. 101·6° F. No haemolysis. Quinine given. No further attacks.

III. F., age 30. Simple tertian: No previous quinine. Probably five months' infection. 4,000 parasites per c.mm., 9.30 a.m., preliminary rigor. No haemolysis. 11 a.m., T. 103·2° F. Serum haemolytic to control corpuscles and to patient's corpuscles. Later, in quiescent stage. No haemolysis.

IIIA. Relapse on discontinuing quinine treatment after discharge: double tertian fever. A very slight shiver before onset of paroxysm. Serum very slightly haemolytic to control corpuscles.

IV. L. Malignant tertian fever: No fever for twelve months till day before observation. T. 103° F. Parasites 7,200 per c.mm. Later, parasites 17,000. Serum haemolytic to control corpuscles and patient's corpuscles.

V. D. Malaria, blackwater fever: Onset at 12.30 a.m. 1 a.m., serum gave very slight haemolysis with normal corpuscles. 3 a.m., 5 a.m., 11 a.m., serum not haemolytic to normal corpuscles; serum not haemolytic to normal corpuscles in presence of control serum.

It will be seen that four of the five positive results were obtained in simple tertian fever, only one in malignant tertian, though most

of the cases examined were of the latter type. A very slight result was obtained in the case of blackwater fever.

In three of the four positive results obtained with simple tertian fever, the positive reaction was obtained in the premonitory stage, and disappeared shortly after when the fever was established. In the other case it was absent in the premonitory stage, and appeared shortly after. None of the cases were under quinine treatment.

The results appeared to be of sufficient importance to communicate, in the hope that further work may be done in places where the material is more abundant.

Positive results appear most likely to be obtained in simple tertian cases at the onset of the paroxysm, when the young sporulating forms are set free in the blood.

They are less easy to obtain in malignant tertian cases where the sporulation is spread over a longer period of time. It is possible that the haemolysis is due to the direct mechanical action of the young forms entering corpuscles, but this would scarcely give such complete haemolysis as occurred in Cases I and II, and it is probably due to a specific haemolysin.

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